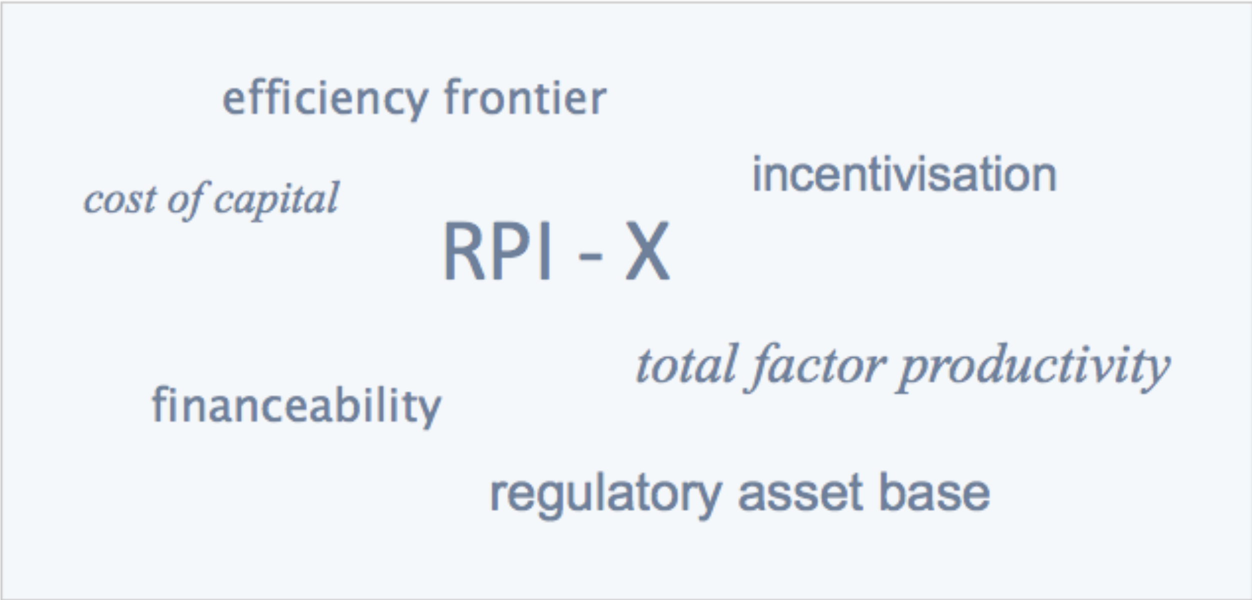
GUIDE TO ECONOMIC REGULATION



Part 4: Estimating the Cost of Capital

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Foreword

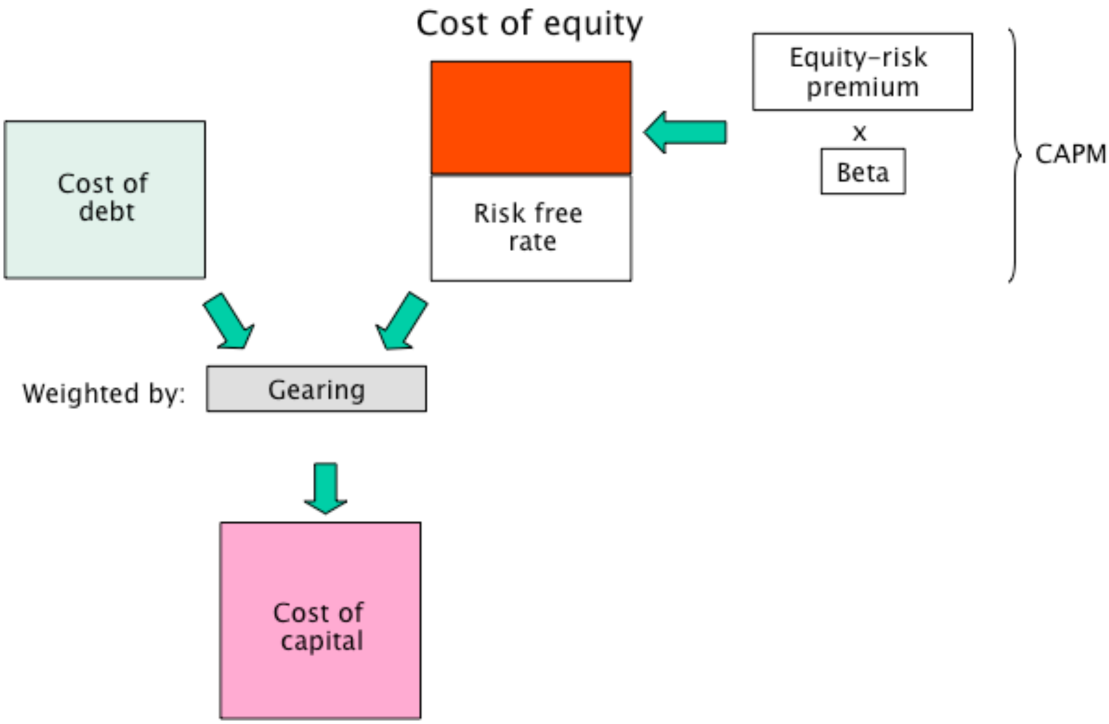
This is Part 4 in a series of booklets which aim to provide individuals working in the regulated aviation, communications, energy, rail and water sectors with an introductory guide to the principles and practices of economic regulation.

The focus in this booklet is the cost of capital. Having shown in Part 2 how a regulator's estimate of the cost of capital is the key determinant of the returns that shareholders get from regulated firms (and also a key determinant of the prices that customers pay), we now examine how a regulator will typically approach the calculation of this number.

1. A Road Map

As a preview of the material in this booklet, the diagram below depicts the inputs that feed into a cost of capital calculation. Our task in the next 20 pages is to work through each component part of the arithmetic so that by the end of this booklet the reader will be familiar with both the concepts and the terminology that are shown below.

Figure 1



2. Gearing

Firms can finance themselves using two distinct forms of capital: debt and equity. When we calculate a firm's cost of capital, we are actually going to calculate two separate costs – the cost of debt and the cost of equity – and weight the two percentage amounts into an overall weighted average cost of capital or "WACC".

The first of the concepts from figure 1 that we need to tick off is gearing. This is a shorthand way of capturing the weight that is to be given to debt versus the weight that is to be given to equity.

2.1 Debt

Let us be clear first of all about the differences between debt and equity capital.

Most people reading this booklet will have their own personal experiences of debt (e.g. student loans, mortgages, credit card debt) and the way that companies borrow is not materially different from the way that we borrow as individuals. Specifically, a firm will take a fixed amount of money from lenders with a promise to pay that money back on a certain date. In the meantime, it will undertake to pay interest on agreed dates at an agreed percentage rate or in accordance with rules that allow for the interest rate to vary over the course of the loan.

All of the terms will be written down into a formal contract, which cannot then be varied without the express agreement of both borrower and lender.

2.2 Equity

Just as lenders to individuals will typically be unwilling to lend 100% of, say, the value of a property, so lenders to firms will typically be unwilling to lend 100% of the value of a firm's regulatory asset base ("RAB"). The balance of the financing that the firm requires will take the form of equity capital.

Equity finance is different from debt finance because a firm is not obligated to return providers of equity capital any particular amount on any particular date. Equity investors instead take a legal share in the ownership of the firm and hope that the firm will be in a position to pay out dividends to its shareholders.

This will only be possible if the firm is able to run its operations profitably – i.e. if there is money left over after the firm has covered all of its expenses and paid all its interest costs.

2.3 The gearing ratio

The weights in the weighted average cost of capital calculation must reflect the relative importance of debt and equity capital. For instance, if a firm with a RAB of £1 billion finances itself with £600m of debt and £400m of equity, the cost of capital will need to be a 60:40 weighted average of the cost of debt and the cost of equity.

The weights that the regulator uses are expressed in terms of a “gearing ratio”. Gearing is simply the amount of debt as a percentage of the RAB – e.g. a figure of 60% in the example that we just gave.

In many cases, a regulator will be happy to match its weights to the real-life mix of debt and equity capital that the firm is using. But there can be exceptions.

The first exception is in the energy network and water sectors, where Ofgem and Ofwat, respectively, choose to calculate a single cost of capital for all of the regional companies. This requires them to use a single, common gearing assumption, which will often reflect what the regulator observes or deems to be the standard level of gearing in a sector.

The second exception can be when a regulator observes that a firm is financing itself in an atypical or peculiar way. We explained in Part 2 that a regulator seeks to calculate the revenues that an efficient firm needs to cover the costs of its services. If a firm is using an inefficient mix of debt of equity – in particular, if a firm, for whatever reason, has too much debt and too little equity – a regulator will say that its task is to cover the financing costs of an efficient firm with an efficient mix of debt and equity capital, not to cost up the consequences of the firm’s sub-optimal financing choices. This will cause the regulator to use a hypothetically efficient or ‘notional’ gearing ratio in its calculations.

Beyond these two minor complications, however, the gearing ratio need not detain us any further. The key point to remember as we continue the analysis is that a regulator’s stated gearing ratio will be the weight that the debt has in the regulator’s final calculation of the weighted average cost of capital, with the weight on the cost of equity, by implication, being equal to one minus gearing.

3. The Cost of Debt

The cost of debt is the more straight-forward side of the calculation. This is for the simple reason that a firm's cost of debt is something that is directly observable.

We said above that the rate of interest that a company has to pay to a lender is typically written down in some form of formal written agreement. This means that a regulator that wishes to calculate a firm's cost of debt can gather together the firm's borrowing agreements and know as a matter of objective fact how much interest the firm is committed to paying at any particular point in time.

The specific value that the regulator will want to compute is the average interest rate that the firm is facing. Suppose, for example, that a company has borrowed on two different occasions and owes Lender A £100m at a 4% rate of interest and Lender B £300m at a 3% rate of interest. The average interest rate or the cost of debt for this firm is 3.25%, i.e.:

£100m x 4% + £300m x 3%

divided by

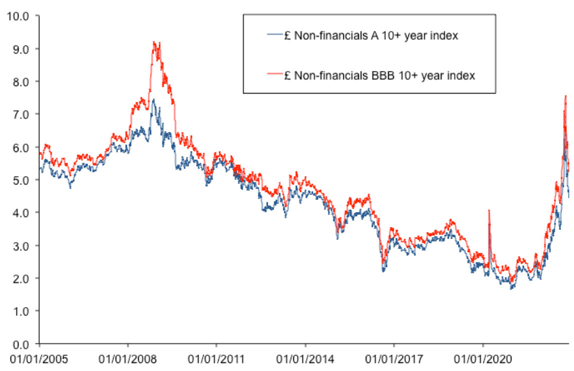
£400m

= 3.25%

The only real complication that a regulator faces here is when it anticipates that a firm will need to borrow brand new money during the course of a regulatory period. This may be because some of the firm's existing borrowing will mature and, hence, will need to be replaced/refinanced by new debt. Or it may be because a firm is investing and growing its RAB, requiring the firm to obtain more investor capital. In either case the regulator will no longer be able to say that it knows that the firm's cost of debt is going to be for the duration of the price control period. Instead, it will have to make a forecast of efficient cost in accordance with its best estimate of future interest rates.

This can be a problematic area for regulators. In figure 2 we depict two benchmarks that regulators often refer to when they wish to get a sense of prevailing corporate interest rates. The regulator's job when making a forecast is, in effect, to predict the direction in which these tram lines are heading next.

Figure 2



A whole range of factors, including the global financial crisis, quantitative easing, Brexit, and Covid-19, have meant that regulators' best forecasts of interest rates have often in the past turned out to be quite a long way off the actual trajectory shown in the above chart. Due in large part to this experience, most of the UK's regulators nowadays recognise that it is almost impossible to forecast interest rates with any accuracy and so provide for indexation or correction mechanisms in their price control determinations (NB: we covered the thinking behind these mechanisms in more detail in Part 3 of this Guide).

For the purposes of this discussion, it is sufficient for us to note that most real-life cost of debt allowances will be the average of the cost of existing embedded debt and the cost of new debt. If, for example, the firm in our earlier worked example were forecast to require another £100m of debt at an expected of 2% per annum the allowed cost of debt for this firm becomes:

£400m x 3.25% + £100m x 2%

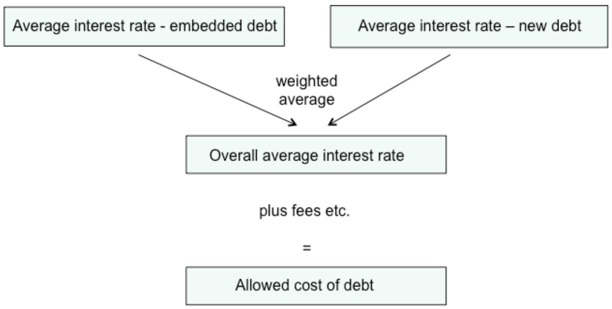
divided by

£500m

= 3.00%

More generally, the overall cost of debt calculation flow chart is as follows.

Figure 3



The only component part in this calculation that we need to cover off before we finish the cost of debt is the final line for fees and transaction costs. The convention in regulation is that regulators provide for costs incurred when raising debt, like underwriter fees, rating agency fees and liquidity facilities, within the cost of debt allowance rather than the main opex price control building block. This necessitates adding a small percentage at the end of the cost of debt calculation with a view to enabling the firm to recover an efficient level of costs over time.

4. The Cost of Equity

Having explained that calculating the cost of debt will normally be a relatively straight-forward task for a regulator, save for any forecasting work that is required, we now turn to the much more complicated job of estimating the cost of equity.

Unlike the cost of debt, the cost of equity is not something that a regulator (or anyone else) can directly observe. This is because, as we explained in section 2, a shareholder that puts equity into a regulated business does not receive a contract containing an entitlement to specific payouts on specific dates. Instead, shareholders in a company have a claim on whatever monies are left after everybody else has been paid.

A shareholder – whether an actual shareholder or a potential shareholder – on seeing this arrangement will assess the return that he or she can expect to earn on any money they put into a firm. The shareholder will only invest if they conclude that the returns on offer are at least commensurate with the returns that can be made from putting money into the myriad of other investment opportunities that are available to current-day investors.

It follows that the regulator's job during a price review is to calibrate a level of return so as to just compensate shareholders for the 'opportunity cost' that they incur when they choose to give up alternative investment options and put their money into a regulated business.

Quite how a regulator should go about this task is a matter of considerable debate. In most cases, however, a regulator will look to the tools that financial practitioners use when they have to assess the cost of capital for projects and companies in the wider world outside the confines of economic regulation. One tool, in particular, has become the regulators' go-to method in UK price reviews: the capital asset pricing model (or "CAPM").

CAPM is essentially a method of triangulation which allows the regulator to assess an investor's required return by reference to two external benchmarks and an adjustment to reflect the riskiness of any particular firm. In the next three sections, we work through the three parameters, before showing how a regulator can draw together an overall estimate of the cost of equity.

4.1 The risk-free rate

The first reference point that CAPM uses is the risk-free rate. The risk-free rate is the return that an investor can obtain if he or she invests their money in a completely riskless asset – i.e. an investment which provides a completely cast-iron guarantee to the investor that they will receive their original outlay back in full, plus a specified return, with no risk whatsoever that payments will not materialise as promised.

Strictly speaking, the riskless asset is a hypothetical construct; in real life, there is no such thing as an investment that is completely free of risk. However, there are investment options out there that come pretty close. The most obvious example is government bonds. When an investor gives his or money to the government of a rich, developed country, they can be fairly confident that the government will make good on any promised rate of interest and pay back the original principal amount when a bond matures. After all, the government has levers available to it that are not available to others, including control over taxation and control over the money supply. While the possibility of a future default cannot be entirely ruled out, such events are extraordinarily rare in western economies and will normally not merit more than a moment's contemplation as the investor hands over their money.

CAPM says that the return that investors can obtain on risk-free investments, like government bonds, is an important first point of reference because it must be that any other organisation that is seeking to attract investor money will have to pay a return that is higher than the risk-free rate. To see why this is the case, consider for a moment why a rational person would choose to put their money into a riskier type of investment for a return that is no higher than the return on a nice, safe, risk-free investment. Of course that wouldn't happen. When presented with a risk-free investment and a riskier investment that pay the same returns, any rational human being would choose to put their money into the risk-free investment. It must be, therefore, that risky investments, including risky regulated companies, have to pay a return that is above the prevailing risk-free rate.

4.2 The expected market return

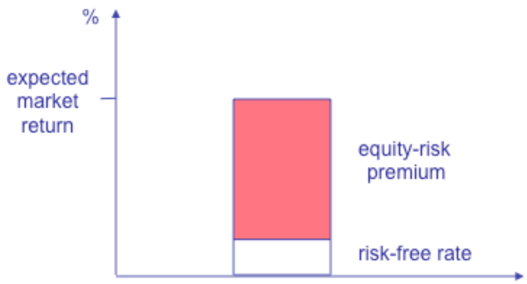
The next value that CAPM looks at is the annual return that investors currently expect to earn if they put their money into the stock market. CAPM terms this reference point the "expected market return".

(Note that, strictly speaking, CAPM allows for the possibility that investors will put their money into other asset classes as well, such as unlisted funds, property and even things like fine art. However, to keep things simple, it is common practice to confine the market of available investments to stocks and shares.)

We must therefore think now, in a UK context, of the return that an investor could obtain if he or she buys into, say, the FTSE All Share Index and own shares in every single one of the firms that is listed on the London Stock Exchange.

The expected market return will necessarily be higher than the risk-free rate, for the reasons set out a few moments ago (i.e. risky investments have to pay higher returns than risk-free investments). We can therefore also think in terms of an "equity-risk premium" or an extra amount of return that investors expect to receive, on average, over time if they invest their money in the market portfolio.

Figure



Here, we need to emphasise that we find ourselves, for the first time, talking about a number that is not directly observable. Whereas the cost of debt and the return on government bonds are known quantities, the expected market return is not a knowable number. A regulator, or anyone else, that wishes to use the CAPM to estimate a firm's cost of equity must therefore look for evidence that will help it to infer what investors expect to earn from their stock market investments. This might, for example, entail looking at:

- the returns that stock markets have historically returned to investors;
- analysts' latest expectations;
- surveys that are conducted periodically to collate investor and other expert views; and/or
- modelled estimates of the returns that an investor will earn if they buy into the market at current valuations and collect the stream of returns that companies are promising to pay or expected to pay in the coming years.

None of these sources of information give a perfect answer, for the simple reason that no one can look into the heads of the people that are out there in the market each day buying and selling shares. A regulator will therefore have to exercise a certain amount of expert judgment when interpreting what the evidence is saying and, subsequently, when coming to a preferred point estimate of the reference point it should use as part of the CAPM triangulation exercise.

For the time being, let us assume that one way or another a regulator is able to arrive at a figure that it feels happy with. That gives the regulator a second market benchmark and permits the regulator to start to think more deeply the characteristics of the particular firm or firms that it is regulating.

4.3 Beta

It is at this point we need to talk about the riskiness of different firms. Intuitively, one would expect that higher risk firms will pay higher returns to investors and lower risk firms will pay lower returns. CAPM captures the level of risk that a particular firm presents to the shareholder investor by assigning a number labelled beta (or β). The scale for these β values is:

- a company with a β of 1 is of average riskiness;
- a company with a β of less than 1 is less risky than the average company; and
- a company with a β of more than 1 is more risky than the average company,

where, in each case, the "average" refers to the average or typical company in the FTSE All Share index.

CAPM then uses a firm's beta to scale up or scale down the equity-risk premium shown in figure 4, so that:

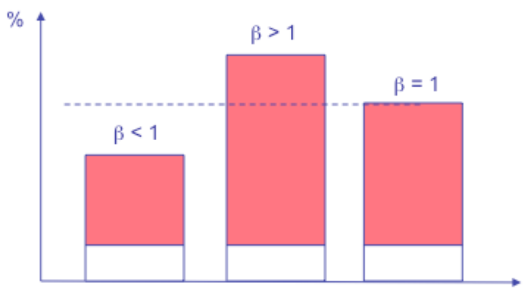
- the expected return from a firm with a β of less than 1 contains a scaled down equity premium and, hence, sits below the total market return;
- a firm with a β of more than 1 contains a scaled up equity premium and is worth more than total market return; and
- the equity premium for a firm with a b of exactly 1 is neither scaled up nor down so that the expected return on that firm's shares sits exactly in line the expected return on the market as a whole

This scaling up and scaling down is illustrated in the diagram below. The white bar is once again the value of the risk-free rate and the red bar is the extra return that investor receives over and above the riskless rate of return as compensation for taking on additional risk. In each case, the cost of equity is scaled in accordance with the formula:

$$\text{cost of equity} = R_f + \beta \times (R_m - R_f)$$

where R_f is the risk-free rate, R_m is the expected market return, and the term in brackets is the market-wide equity-risk premium.

Figure 5



Now comes the really crucial point. CAPM looks at risk in a very particular way and says that some risks matter and affect the value betas while other risks do not. The classification is broadly into two types of risk:

- systematic risks – i.e. risks that affect all of the firms in the economy to a greater or lesser extent, and
- non-systematic risks – i.e. risks which are company- or industry-specific in nature.

CAPM says that systematic risks count, but that an investor can disregard non-systematic risks.

To see the importance of this distinction, think of an investor that is contemplating investing in, say, an ice-cream seller. The investor might think that the weather is a very important risk factor in that if we have a very hot summer the vendor will sell lots of ice-cream, make good profits and give good returns to the shareholder, but if we have a bad summer the vendor will have very poor sales, little or no profits and the shareholder will lose money.

After a moment's pause, however, the investor may realise that they could also invest in an umbrella manufacturer. Here the exposure to risk is the exact opposite: if we have a good summer the firm will do badly, but if we have a very rainy summer the firm will do well.

Seeing this, the investor will start to relax much more about the weather. In particular, the investor will know that, if she holds shares in both types company as part of a broad stock portfolio, the value of her wealth need not be affected by the number of rainy days because the impact of the daily or weekly or monthly weather forecast on one of his holdings will be offset by the impact on another holding.

CAPM does not, in fact, even require that we have to be able to identify pairs or groups of companies that balance each other out in this somewhat contrived way. Instead, it is sufficient to proceed on the assumption that every company will be dealing with a basket of risks and that those risks will crystallise at random in a positive way or in a negative way with broadly similar probabilities and broader similar impact. CAPM then says that over any non-trivial time horizon the number of companies getting good news will roughly balance out with the number of companies getting bad news, such that an investor with a large, diversified stock portfolio will not, ultimately, see the value of his wealth increase or decrease depending on the ways in which the various company-specific risks that are out there happen to materialise.

What does affect the value of the investor's wealth, however, is the incidence of systematic risks. These kinds of risks impact all companies simultaneously and generally in the same direction. The strategy of diversification that works so well for company-specific risks therefore does not and cannot protect the investor against the effect that systematic risks have on the value of companies. Instead, the value of the investor's wealth *will* unavoidably be affected by the way in which systematic risks crystallise over time.

Knowing this, an investor will have no choice but to pay attention to the ways in which individual companies are affected by systematic risks. CAPM says that:

- a company whose returns are very strongly affected by systematic risk factors will have a high beta and will have to return relatively high returns to shareholders in compensation for the risk that it presents to the investor's wealth; and
- a company whose returns are much less affected by systematic risk factors will have a low beta and can pay relatively low returns.

The table opposite provides a somewhat simplistic classification of the risks that may affect regulated firms under the headings of "systematic risks" and "non-systematic risks".

Table 1

Systematic				Non-systematic
GDP risk				
Inflation risk				
Interest rate risk				
	Demand risk			
		Construction risk		
				Operational risk
				Regulatory risk

Macroeconomic risks, by and large, go in the left-hand side of the table, on the grounds that all companies care in one way or another about GDP growth, inflation and interest rates. Firms that are particularly affected by such risks therefore have high betas, and firms that are much less affected have low betas.

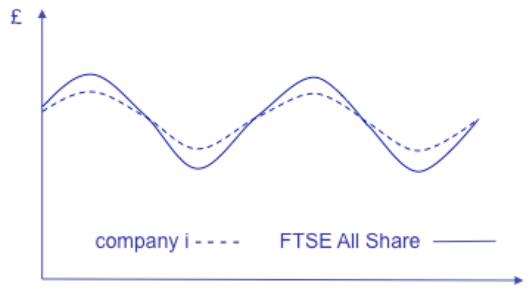
The entries, in the right-hand column of the table, by contrast, are likely to have a heavy company- or industry-specific component, in that there is little reason to think that the performance of a company's assets or the actions of the regulator will be correlated across sectors. These risks do not, therefore, impact on betas.

In the middle are a group of risks that could conceivably have both systematic and non-systematic components. For example, demand risk could result from changes in the overall level of demand in the economy (a systematic risk) as well as changes in customers' preferences and tastes (a non-systematic risk). Similarly, construction risk could be about delivering projects to time and budget (non-systematic) or prices over the construction cycle (potentially systematic).

In practical terms, a regulator that wants to know what kind of beta a regulated firm has may be able to measure that company's beta empirically. If the company's shares are publicly traded, a regulator will look at the company's share price and observe the correlation that there has been historically been changes in the share price and changes in the value of the stock market as a whole.

In figure 6, we depict the kind of company that might have a beta of less than 1.

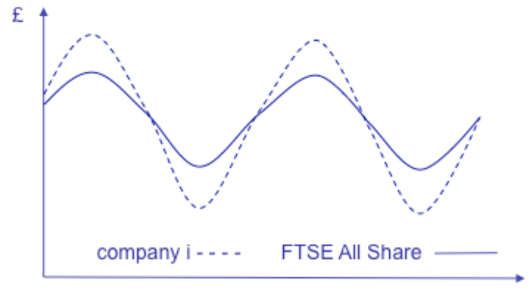
Figure 6



It can be seen that this company's share price exhibits some correlation with movements in the stock market, but in a relatively muted way.

Figure 7 shows a company with a beta of more than 1.

Figure 7



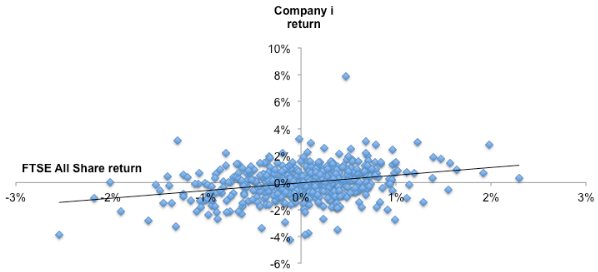
This company's share price also moves in the same direction as other stocks but in a much more exaggerated way.

In order to obtain a precise value for beta, the regulator will run a regression using daily, weekly or monthly historical share price data. The regression equation will be of the form:

$$R_i = \alpha + \beta \cdot R_m$$

where R_i is the return that an investor gets from company i, R_m is the return that the investor gets from the market portfolio and β – the slope of the regression line – is the estimated CAPM beta.

Figure 8



4.4 The overall cost of equity

The regulator now has all the inputs that it needs to calculate a firm's cost of equity. The final step is to bring the risk-free rate, the expected market return and beta together using the CAPM formula:

$$\text{cost of equity} = R_f + \beta \times (R_m - R_f)$$

To recap, the logic here is that equity investors require a return that is above the return that can be obtained from investing in a risk-free asset. The size of the additional return is a scaled-up or scaled-down version of the market-wide, equity-risk premium, where the scaling factor, β, reflects the firm's relative exposure to systematic risks, as seen in the observed correlation between movements in the firm's share price and changes in the value of the stock market as a whole.

To give a simple worked example of this maths, suppose that the regulator works through all of the analysis that we laid out in this section 3 and arrives at the following values for the CAPM parameters:

Risk-free rate = 2%
Expected market return = 10%
Beta = 0.75

The calculated cost of equity would be:

$$\begin{aligned}\text{Cost of equity} &= 2\% + 0.75 \times (10\% - 2\%) \\ &= 2\% + 0.75 \times 8\% \\ &= 2\% + 6\% \\ &= 8\%\end{aligned}$$

5. The Weighted Average Cost of Capital

The overall level of return that the regulator factors into its allowed revenue calculation is simply the weighted average of the cost of debt and the cost of equity, i.e.:

$$\text{WACC} = g \times \text{cost of debt} + (1 - g) \times \text{cost of equity}$$

where is g, the weight given to the cost of debt side of the calculation, aligns to the level of gearing.

If, for example, the cost of debt is 3%, the cost of equity is 7% and gearing is 60%, the WACC will be:

$$\text{WACC} = 0.6 \times 3\% + 0.4 \times 8\% = 5.0\%$$

6. Implementation

Before concluding, it is necessary to finish off with a quick discussion about the treatment of inflation.

The cost of capital that we calculated in the preceding pages can ultimately be expressed in two alternative ways, as either:

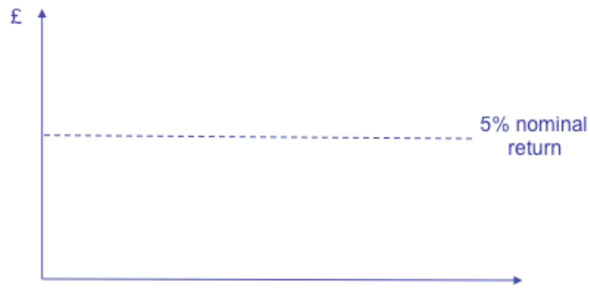
- the full calculated nominal cost of capital; or
- the equivalent inflation-stripped real cost of capital.

The final cost of capital number that a regulator inserts into its allowed revenue calculation depends on exactly how investors are to be compensated for the effects of inflation.

One approach is for the regulator to provide for the nominal cost of capital to be paid by customers in full each year. In figure 9 we show the profile of income that an investor would receive under this approach using the simplifying assumptions that a company's RAB is a constant £m value and the company pays out the full value of its 5% allowed return each year.

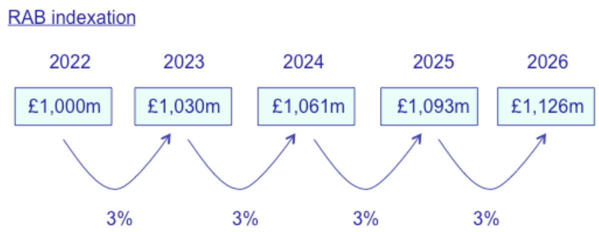
(Note: this stream of payments is analogous to the income that an individual would receive if he or she puts money into a conventional bank account and withdraws the interest earned immediately after receipt.)

Figure 9



Most regulated company's returns are not structured in this way. Instead, the regulator provides for a return on a RAB that indexes in line with inflation. Let us suppose, for the purpose of illustration only, that inflation runs at a constant 3% a year. If the RAB indexes in line with inflation, the regulator will uprate the value of the RAB by 3% every year. A RAB with an initial value of £1,000 will then change as shown in figure 10.

Figure



What rate of return should the regulator apply to this kind of inflation-indexed RAB? The answer is that the regulator should downsize the % allowed return in recognition of the value that the company and its investors will obtain from RAB indexation. Specifically, the regulator should deduct the value of expected inflation from the calculated nominal cost of capital and calculate only the real, after-inflation cost of capital using the formula:

real cost of capital = nominal cost of capital
minus inflation rate

Or, in strict mathematical terms:

(1 + real cost of capital)
= (1 + nominal cost of capital)
divided by
(1 + inflation rate)

This formula ensures that the total return that the company receives from the combination of the in-year real return plus the indexation of its RAB exactly equals the calculated nominal of capital. For example, if a company's nominal cost of capital is 5% and RAB indexation has an expected worth of 3% a year, the real rate of return that the regulator inserts into its building block calculation of allowed revenue need only be set equal to a residual value of 2% per annum in order to ensure that investors receive their cost of capital in full.

The £ returns that an investor receives through allowed revenues when a regulator applies a real cost of capital to a growing, inflation-indexed RAB is shown in figure 11.

(Note: this stream of payments is analogous to the income that an individual will receive if he or she puts money into an index-linked savings bond.)

Figure 11

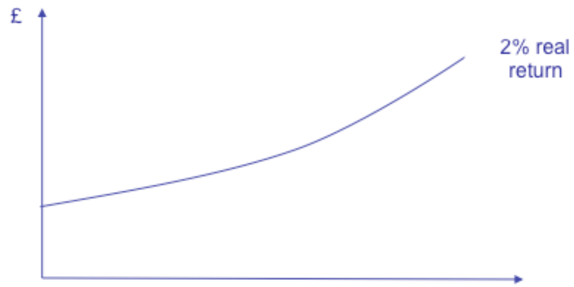
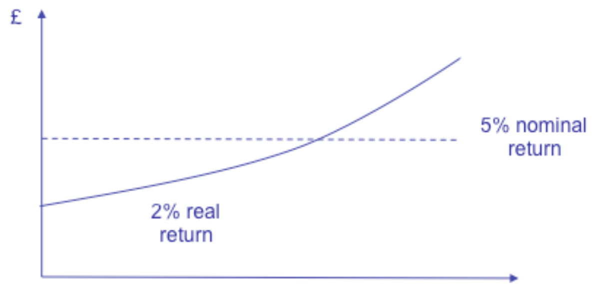


Figure 12 overleaf puts the two possible payment profiles from figure 10 and figure 11 side by side.

Figure 12



Importantly, an investor looking at this chart would see two streams of promised income with broadly equivalent values. Accordingly, there is no a priori reason to prefer the solid line over the dotted line or vice versa. An investor receiving a nominal rate of return on a flat RAB will be just as well off as an investor that collects a real rate of return on an inflation-indexed RAB.

Why then do regulators typically choose to provide for a real rate of return? There is no single answer to this question, but in many industries we have to go back to the material in Part 2 of this guide that deals with the way in which regulators approach inflation more generally. Recall that we said there that regulators choose to protect companies from the uncertain effects that real-world inflation will have on their costs over the course of a price control period. The same principle applies here in that a regulator that applies a real rate of return to an index-linked RAB provides, in effect, for a total realised return that will automatically move up when inflation is high and move down when inflation is low.

It so happens that many investors in regulated industries quite like and actively seek out this sort of inflation-proof return, particularly investors that have inflation-linked liabilities like pension funds. As a consequence, the use of a real cost of capital is now pretty well embedded in most of the UK's regulated industries as a permanent – and attractive – feature of the regulatory model.

7. A real-life example

We conclude this Part 4 by presenting a real-life example of a recent cost of capital estimate.

The table opposite reproduces Ofwat's PR19 calculation of a water and sewerage company's cost of capital for the period 2020 to 2025. The calculation proceeds according to the methodology we outlined in the preceding sections:

- in line 1, we can see that Ofwat decided that it would calculate the cost of capital as a 60:40 weighted average of the cost of debt and the cost of equity;
- between lines 2 and 6 we see the component parts of Ofwat's cost of debt calculation. Ofwat weights the cost of embedded debt and the cost of new debt 80:20 and adds a small allowance for fees;
- lines 7 to 10 contain Ofwat's CAPM parameters, which Ofwat combines into a cost of equity using the CAPM formula;

$$\text{cost of equity} = R_f + \beta \times (R_m - R_f)$$

- lines 11 to 13 contain the transformation from a nominal cost of capital to a real, CPIH-stripped cost of capital.

Table 2

Gearing	60%
Cost of embedded debt	4.47%
Cost of new debt	2.54%
Weight for embedded debt	80%
Issuance and liquidity costs	0.1%
Nominal cost of debt	4.18%
Risk-free rate	0.58%
Expected market return	8.63%
Beta	0.71
Nominal cost of equity	6.27%
Nominal cost of capital	5.02%
Expected CPIH inflation	2.0%
Real cost of capital	2.96%